840-WP-008-002

M&O LAN System Evaluation and Recommendation for the ECS Project

White Paper

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Executive Summary

We recommend that ESDIS consider a transition of the Configuration Management functions, technology cost/benefit assessment, the overall procurement and acquisition for COTS hardware and software for the M&O LAN from the ECS contractor to the DAACs. The benefits to both ESDIS and the DAACs are described below.

A transition would benefit the government in two ways, cost and operations. The M&O LAN environment is managed on a daily basis by the DAAC with minimal ECS/EDF input. The ECS/EDF role is primarily oversight, procurement, and property management activities. Given that the DAACs have cost effective procurement methods, and are currently property custodians for ECS, the government will realize the cost savings associated with the ECS/EDF labor hours and procurement overhead.

A transition during the extension period would allow additional and immediate flexibility to the DAAC to perform system upgrades and technology refresh via a streamlined process utilizing established DAAC procurement methods.

- Potential realization of cost saving by consolidation and streamlining of the CM functions being performed locally at the DAACs instead of centrally at the EDF. This would eliminate the on-site Physical Configuration Audits (PCA) currently being performed by M&O System Engineering twice per year. Documented savings are18 travel days and associated travel costs to LP DAAC, NSIDC, and LaRC.
- There will be a realization of cost saving from purchasing only hardware for the PC-based workstations for technology refreshment and updates and not the software suite that run on the PCs. For example, DAACs may have site license agreements for Windows, MS Office products, and other COTS software and need to purchase only the PC hardware. This will help reduce overall yearly procurement and acquisition costs for the PCs because ECS currently purchases PCs with software suites.

Operational Benefits

Each DAAC is substantially unique and autonomous in M&O LAN operations. Giving each DAAC operational and budgetary responsibilities will enable the DAACs to use their systems engineering and procurement staffs to assess their own needs and technology cost/benefit trades which will expedite the engineering and procurement process. This will use resources more effectively and efficiently and permit technology refresh solutions to be implemented in a timely manner and, eliminate the added steps of the ECS contractor performing engineering and procurement. Because the M&O LAN is not subject to the formal ECS CM process the ECS contractor cannot adequately maintain CM control. Transferring the M&O LAN to the DAACs enables the DAACs to maintain CM control via their local CCB process and realize productivity gains by further streamlining the work process.

Mitigated Risks

Risks of compromising security and performance degradation of ECS production system are averted by creating planned ICD for each DAAC, observing CM process and maintaining strict security rules that are hosted on Firewall and supported by ECS design.

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Appendix A. Listings of Hardware and Software COTS Products by DAAC

Abbreviations and Acronyms

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1. Scope

1.1 Introduction

This document includes and addresses:

- Technical analysis and trade study of system security and performance of transitioning the M&O LANs
- Annual Cost for managing and refreshing the technology for "as built" M&O LAN architecture
- Identification of recommended Roles and Responsibilities of DAACs for M&O LAN system following the transition of LAN management responsibilities to DAAC
- Description of content and estimate of efforts for developing an ICD between the M&O LAN System and ECS for each DAAC
- High level M&O LAN transition plan and schedule for the turn over of responsibility from Raytheon to DAAC should decoupling of M&O LAN from ECS/EMD occur

1.2 Approach

The diagram below depicts the methodology used to perform the M&O LAN Study evaluation.

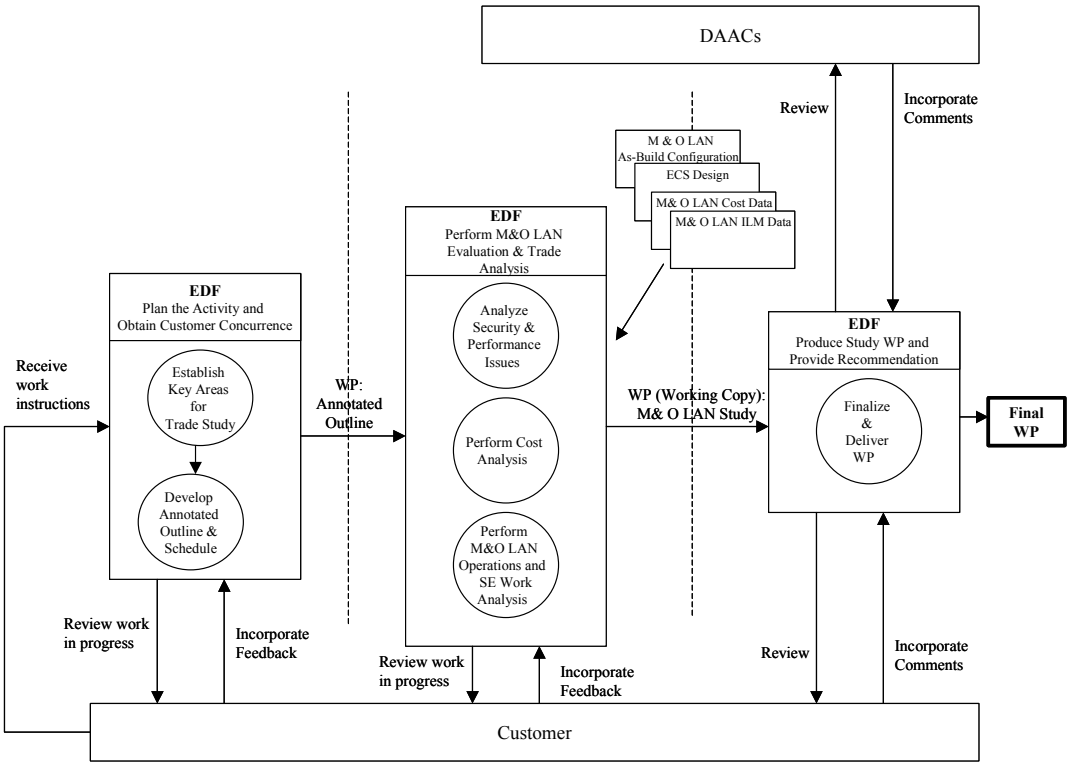

Figure 1-1. Evaluation Methodology

2. Related Documentation

2.1 Information Documents

Documents referenced in this section are listed below.

840-TP-002 GSFC DAAC and SMC M&O Equipment (As-Built Configuration)

840-TP-004 LaRC DAAC M&O Equipment (As-Built Configuration)

840-TP-001 EDC DAAC M&O Equipment (As-Built Configuration)

840-TP-003 NSIDC DAAC M&O Equipment (As-Built Configuration)

2.2 Web Page Based References:

http://edhs1.gsfc.nasa.gov:8001/edhs1.gsfc.nasa.gov/QuickSearch?840

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3. M&O LAN Architecture and Services

Detailed M&O LAN system architecture by DAAC is provided in the 840-TP-001, 002, 003, and 004 documents. The listing of M&O LAN system equipment for the items such as PCs, workstations, servers, printers, etc. and software by DAAC is provided in Appendix A of this White Paper.

External Interfaces are included in section 4. It provides a description of what data flows through the M&O LAN system elements and how security and integrity of M& O LAN and ECS Operational System are protected, managed & maintained.

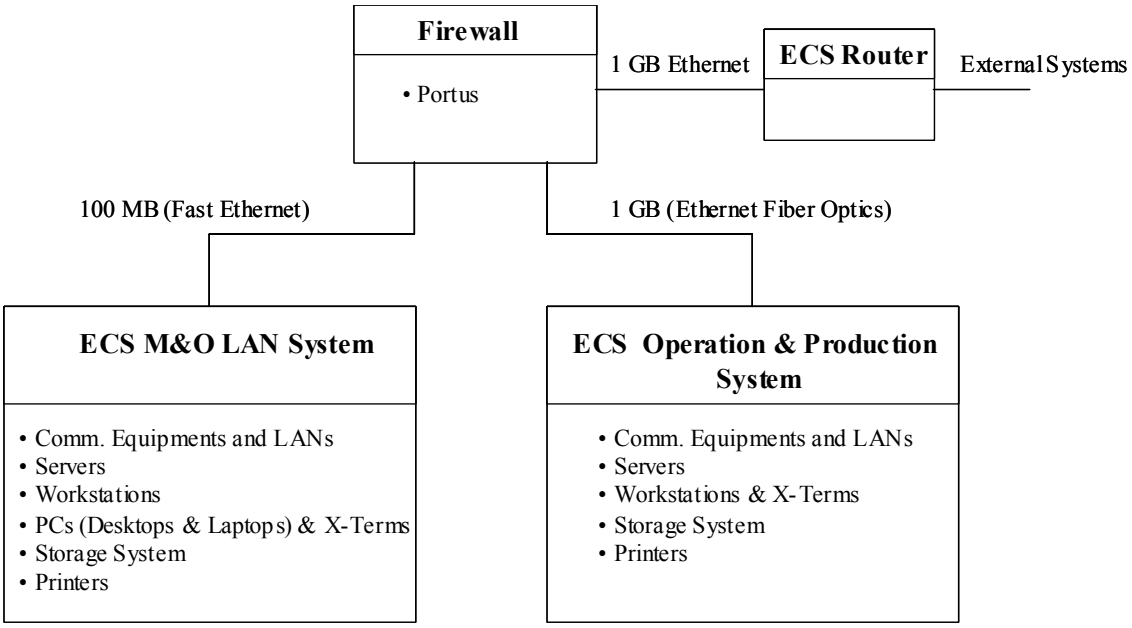

Figure 3-1. High Level System Block Diagram of M&O LAN System

3.1 M&O LAN Services

The functions and services provided by M&O LAN at each DAAC site:

3.1.1 General

- System administration. The capability to backup and restore files from each component is provided.
- Status and performance reports. The DAAC M&O Equipment provides the tools to review and analyze system status and performance reports.
- Management and technical reports. The DAAC M&O Equipment provides the tools to review and/or develop management and technical reports on ECS performance.
- DAAC internal coordination. The DAAC M&O Equipment provides the tools in support of coordination within the DAAC.
- DAAC external coordination. The DAAC M&O Equipment provides the tools in support of coordination with other organizations including, at a minimum, other DAACs, the SMC, and other ECS organizations.
- ECS documentation. The DAAC M&O Equipment provides the tools to access, create, and maintain ECS documentation.

3.1.2 Management and Administration

- Management planning resources. The DAAC M&O Equipment provides tools to support planning, budgeting, accounting, resource management, scheduling and other contract management activities.
- Management policies and procedures. The DAAC M&O Equipment shall provide the tools to develop and maintain ECS, DAAC and/or and procedures.
- Management and Engineering
- Management documents. The DAAC M&O Equipment provides tools for production and maintenance of memos, reports, and expense reports.

3.1.3 Engineering

- Operations data. The DAAC M&O Equipment provide the tools to allow for retrieval, storage, analysis, and distribution of operations data.
- DAAC analysis software. The DAAC M&O Equipment provides the tools to create and maintain DAAC-unique software.

3.1.4 Operations

- The DAAC M&O Equipment provides the tools to develop and administer policies, directives, and guidance to implement both ECS and DAAC operations tasking, procedures, practices, and priorities.

4. Security & Performance Analysis

Each DAAC has very unique security rule sets. Still, each DAAC is under 'Earth Observing System Data and Information Systems (EOSDIS) Security Policy and Guidelines'. In turn, EOSDIS Security Policy and Guidelines are in compliance with OMB Circular A-130 and NASA Procedures and Guidelines (NPG) 2810.1 Security of Information Technology. Turning over responsibility for M&O LAN to each DAAC in no way changes their responsibility to meet those guidelines. Each DAAC must protect IT resources as mandated by NPG 2810.1 now and in the future.

All sites communicate with their surrounding campus to some degree. Communications between sites M&O LAN and B0 LAN for the most parts is for administration and management of B0 hosts and services. Below are the main points about firewalls at each DAAC and relationship to EDF Landover security personnel.

- Each DAAC is currently responsible for the daily administration of the DAAC firewall
- Each DAAC Security system Administrator has control of changes to existing or new firewall rules for both B0 and M&O LAN
- Firewall hardware and software applications is under baseline control, but not the security rules
- The current and assumed future EDF security functions provide the following:
    - Provide second tier firewall support for DAAC
    - Acquire and test patches and upgrades in VATC and PVC to both firewall hardware and software before release to DAAC
    - Weekly conference with DAAC on firewall and other security related items
    - All M&O LAN summaries reflect present, March 2003, firewall security rules at each DAAC
    - The PORTUS proxy firewall by default denies all connections unless a rule is written explicitly to one of the proxies to allow the flow

A general breakdown of traffic flows from and to the M&O LAN follows. The summary is broken down by the types of flows, FTP, HTTP, etc., and the direction of the flow. Inbound is from outside the firewall boundary, unprotected side, in to the M&O LAN, protected side. Outbound is from the M&O LAN to the unprotect sites or the DAACs own B0 network which is also protected by the firewall.

The heading 'General Proxy' in section 4.1 is the generic proxy that uses IP address and port number to create a connection across the firewall. The General Proxy provides lots of flexibility by acting more like an access list filter but can be said to provide less detail protection. For

instance FTP proxy allows you to look inside the packet to check for type of FTP request like GET and PUT.

4.1 Summary of Inbound and Outbound M&O Flows at NSIDC:

FTP Proxy –

- Any M&O host can FTP outbound via the firewall to anywhere
- There are no inbound FTP rules for M&O hosts.

TELNET Proxy –

- Any M&O host can TELNET outbound via the firewall to anywhere
- There are no inbound TELNET rules for M&O LAN hosts.

RPC Proxy (UDP) –

- Any M&O host can NTP outbound to two government timeservers
- Any M&O host can NTP outbound to three B0 timeservers
- There are no inbound PRC rules for any M&O host

HTTP Inbound Proxy –

- Three "Quinton ESDIS" host inbound to one M&O host

HTTP Outbound Proxy –

- Any M&O host (and some other sites) outbound to one B0 host
- Any M&O host outbound to different B0 host
- Any M&O host (and some other sites) outbound to different B0 host
- Any M&O host (and some other sites) outbound to different B0 host
- Any M&O host can HTTP outbound to anywhere

General Proxy (SOCKET) –

- Any M&O host can SSH outbound to almost all B0 host and communication equipment
- Any M&O host can outbound print to three B0 printers
- Any M&O host can outbound do Sybase database management to eight B0 database servers
- Any M&O host can outbound do Sybase database management to another B0 database server
- Any M&O host can outbound to Colorado U. for POP3 and IMAP

- Any M&O host can outbound to Colorado U. for NNTP services
- Any M&O host can connect outbound to Colorado U. on one port
- Any M&O host can connect outbound to Colorado U. on three different ports
- One "Navistar timekeep" outside host can connect inbound to one M&O LAN host on two ports

4.2 Summary of Inbound and Outbound M&O Flows at LaRC:

FTP Proxy –

- Any M&O host can FTP outbound to via the firewall to anywhere
- There are no inbound FTP rules for any M&O hosts.

TELNET Proxy –

- Any host on M&O can TELNET outbound via the firewall to anywhere
- There are no inbound TELNET rules for any M&O host

RPC Proxy (UDP) –

- Any M&O host can NTP outbound via the firewall to a DOD government timeservers
- An M&O host can via the firewall get SNMP from B0 communication equipments and ECS router.
- There are no inbound PRC rules for any M&O host

HTTP Inbound Proxy –

- From anywhere on Internet to a single M&O host
- From any host/s on several networks (including B0) to a different M&O LAN host
- From any host on three networks (including B0) to another different M&O LAN host

HTTP Outbound Proxy –

- Any M&O host can HTTP outbound to anywhere

General Proxy (SOCKET) –

- Any M&O host can SSH outbound to almost all B0 communication equipment
- Any M&O host can SSH outbound to almost all B0 host
- Any M&O host (but only now done from one) can use LaRC home grown monitoring tool to check almost all B0 hosts
- Any M&O host can outbound do Sybase database management on eight B0 database servers
- Any M&O host can outbound do Sybase database management to another B0 database server
- Any M&O host can outbound to one B0 host on two ports
- Any M&O host can outbound to another different B0 host on two ports
- Any M&O host can outbound SSH to ECS router
- Any M&O host can outbound print to several LATTIS printers
- Any M&O host can outbound print to one of five B0 printers

- Any M&O host can outbound to LARC for POP3
- Any M&O host can outbound do Sybase database management to a SMC database server
- From anywhere on the Internet can inbound SSH a single M&O host
- From any B0 host can inbound SSH to several M&O host
- Three outside host can inbound SSH to three different M&O host
- From anywhere on the Internet can do POP3 inbound to single M&O host

4.3 Summary of Inbound and Outbound M&O Flows at GSFC:

FTP Proxy –

- Any host on M&O can FTP outbound via the firewall to anywhere
- There are no inbound FTP rules for any M&O host

TELNET Proxy –

- Any host on M&O can TELNET outbound via the firewall to anywhere
- There are no inbound TELNET rules for any M&O host

RPC Proxy (UDP) –

- Any M&O host outbound can NTP and Time outbound to one B0 timeserver
- An M&O host outbound can via the firewall get SNMP from B0 communication equipments, ECS router and most B0 host
- An M&O host outbound can via the firewall get SNMP from SMC communication equipment
- An M&O host outbound can via the firewall get SNMP from GSFC communication equipment
- An M&O host outbound to several GSFC "Meeting Maker" servers
- There are no inbound PRC rules for any M&O host

HTTP Inbound Proxy –

- From anywhere on Internet inbound to five M&O host for different services

HTTP Outbound Proxy –

- Any M&O host can outbound HTTP to five B0 WEB servers
- Any M&O hosts can outbound HTTP to anywhere

General Proxy (SOCKET) –

- Any M&O host can outbound SSH outbound to B0 switch
- Any M&O host can outbound do Sybase database management on eight B0 database servers
- Any M&O host can outbound do Sybase database management on one SMC database server
- Any M&O host can outbound SSH to most B0 host
- A single M&O host can outbound to three B0 license servers, two ports
- Any M&O host can outbound print to four B0 printers

- A single M&O host can outbound to six B0 for RAID management, one port
- A single M&O host can outbound to seven B0 for host management, one port
- A single M&O host can outbound to one B0 for host management, one port
- Any M&O host can outbound SSH to ECS router.
- Any M&O host can outbound SSH to one SMC host
- Any M&O host can outbound Telnet to one SMC host
- A single M&O host can outbound to three GSFC Meeting Maker servers, one port
- From anywhere on the Internet can inbound SSH to six M&O hosts
- From any B0 host can inbound print to one M&O LAN printer

4.4 Draft Summary of Inbound and Outbound M&O Flows at LP DAAC:

FTP Proxy –

- Any hosts on M&O can outbound FTP via the firewall to anywhere
- Any hosts on M&O can outbound FTP to two B0 hosts
- From anywhere on the Internet via user ID can inbound FTP to one M&O host
- From anywhere on the Internet via anonymous, limited access, can inbound FTP to same M&O host as above

TELNET Proxy –

- Any hosts on M&O can TELNET outbound via the firewall to anywhere
- There are no inbound TELNET rules for any M&O LAN host

RPC Proxy (UDP) –

- Any M&O host can outbound SNMP to five B0 printers
- Any M&O host can outbound SNMP to two B0 switches
- Any M&O host can outbound SNMP to ten B0 hosts
- Any M&O host can outbound SNMP to ECS router
- Any M&O host can outbound NTP to one outside host
- Any M&O host can outbound to one USGS host, two ports
- Any M&O host can outbound to seven outside hosts, one port
- Any M&O host can outbound to six USGS hosts, two ports
- One M&O host can outbound to one USGS host, one port
- Any M&O host can outbound SNMP to five USGS hosts
- Any M&O host can outbound one USGS host, two ports
- From any B0 host can inbound SNMP to three M&O printers
- From one USGS host can inbound to one M&O host, one port

HTTP Inbound Proxy –

- From a limited number (IP address controlled) of outside hosts can inbound HTTP to one M&O host for different services
- From a limited number (IP address controlled) of outside hosts can inbound HTTP to another M&O host

HTTP Outbound Proxy –

- Any M&O host can outbound to several B0 WEB servers for different services
- Any M&O host can outbound HTTP to anywhere

General Proxy (SOCKET) –

- Any M&O host can outbound SSH to most of the B0 hosts
- Any M&O host can outbound Netscape Administration to three B0 host
- Any M&O host can outbound print to five B0 printers
- Any M&O host can outbound do Sybase database management on ten B0 database servers
- Any M&O host can outbound do Sybase database management on one SMC database server
- A single M&O host can outbound do Sybase database management on one different B0 database server
- Any M&O host can outbound to one B0 license server, two ports
- Any M&O host can outbound to two other B0 license servers, two ports
- Any M&O host can outbound to one B0 host for Oracle work, two ports
- Any M&O host can outbound to two B0 hosts for SSM, one port
- Any M&O host can outbound do Veritas Vol. Management on eight B0 hosts
- Any M&O host can outbound do Remedy on one B0 host
- Any M&O host can outbound t to one B0 host, MTM testing
- Any M&O host can outbound to two USGS host, two ports
- Any M&O host can print outbound to five USGS printers
- Any M&O hosts can outbound to five USGS hosts, Novell
- Any M&O host can outbound to one USGS hosts, VPN
- Two M&O host can outbound to two USGS hosts, Windows
- Any M&O host can outbound to an outside host for time keeping

5. ECS Cost Analysis for Current M&O LAN Management

This section provides ECS cost data analysis for current M&O LAN management and related functions. It includes:

- Potential cost increase due to the DAAC absorbing the cost of purchasing a Technical Support for two seats at each DAAC for COTS Legato software. This could potentially be mitigated by ECS negotiating for the DAAC the cost.
- Labor cost (in terms of hours) for M& O LAN management function provided by EDF,
- Actual cost for COTS software and hardware maintenance and licensing for period 1/1/03 through 12/31/03, and
- Cost for DAAC expansion and technology refreshment HW for period 1/1/01 through 12/31/02.
- The "Fully Burdened" cost reflected on the following spreadsheets reflects the cost to NASA as reported on the annual NASA 1018 (NASA Property in Hands of Contractors) report.

The following table provides an estimate of annual labor hours for the M&O LAN management and various engineering, procurement and support services that are currently provided by EDF personnel.

Table 5-1. ECS/EDF Annual Labor Estimate

Role/Responsibility	Yearly Labor hours at EDF	Comments
• System Engineering (COTS H/W, S/W evaluation and engineering for expansion and technology refresh) • Configuration Management - Documentation Updates, - DAAC on-site Physical Configuration Audit (PCA) twice per year and associated travel costs, - CCR Generation, etc.	0.30 FTE	Includes support to all DAACs
Security and Network Engineering and Management	0.10 FTE	Includes support to all DAACs
COTS Software/Hardware Maintenance and License Management	0.05 FTE	Includes support to all DAACs
Purchasing Support	0.10 FTE	Includes support to all DAACs
Property Management	0.10 FTE	Includes support to all DAACs)

Following tables provide the reoccurring cost summary data by DAAC for COTS software and hardware for M&O LAN system.

5.1 GSFC DAAC

Table 5.1-1. GSFC HW Maintenance

EIN	Hostname	Manufacturer	Maint / Vendor	Comments	Fully Burdened HW Maintenance Cost
14812	g0mos01	SUN	SUN		$241
14813	g0mos02	SUN	SUN		$241
14814	g0mos03	SUN	SUN		$241
14815	g0mos04	SUN	SUN		$241
14817	g0mos06	SUN	SUN		$241
14818	g0mos07	SUN	SUN		$241
14819	g0mos08	SUN	SUN		$241
14821	g0mos11	SUN	SUN		$241
14730	g0mos13	SUN	SUN		$241
14732	g0mos15	SUN	SUN		$241
14824	g0mos18	SUN	SUN		$241
14735	g0mos20	SUN	SUN		$241
12351	g0mos21	SUN	SUN		$241
14827	g0mos22	SUN	SUN		$241
14816	g0mos05	SUN	SUN		$241
6863	g0mos09	SUN	SUN		$3,695
14820	g0mos10	SUN	SUN		$241
14822	g0mos12	SUN	SUN		$241
14731	g0mos14	SUN	SUN		$241
3383	g0mos16	SUN	SUN		$4,330
3341	g0mos16	STK	STK		$8,378
14733	g0mos17	SUN	SUN		$241
14825	g0mos19	SUN	SUN		$241
14828	g0mos23	SUN	SUN		$241
14829	g0mos24	SUN	SUN		$241
14830	g0mos25	SUN	SUN		$241
14831	g0mos26	SUN	SUN		$241
14734	g0mos27	SUN	SUN		$241
12176	g0mos28	SUN	SUN		$241
357	g0mos29	SUN	SUN		$241
14823	g0mos30	SUN	SUN		$241
11474	unknown	CISCO	Ingram Micro		$168
11611	unknown	CISCO	Ingram Micro		$168
11473	unknown	CISCO	Ingram Micro		$168
20348	unknown	CISCO	Ingram Micro		$117
11477	unknown	CISCO	Ingram Micro		$168
11470	unknown	CISCO	Ingram Micro		$168
11472	unknown	CISCO	Ingram Micro		$168
11478	unknown	CISCO	Ingram Micro		$168
11476	unknown	CISCO	Ingram Micro		$168
11475	unknown	CISCO	Ingram Micro		$168
20349	unknown	CISCO	Ingram Micro		$117
11082	g0mop30	Micron	Micron	Warranty until June 2003	$0
Multiple	PCs and HP Printers	Multiple	Daly	Daly time and material maintenance cost is $50.00 to $100.00 per hour depending on HW	$0
				Total Cost	**$24,879**

Table 5.1-2. GSFC SW Maintenance

EIN	Hostname	Software	Manufacturer	Comments	Fully Burdened SW Maintenance Cost
5189	g0mos01,	Legato NetWorker Technical Support	Legato	Cost for tech support contacts is included in overall cost to ECS for Legato maintenance. Normaly Legato only allows two contacts per contract, but because of the seize of the ECS contract, Legato allows additional contacts. Cost to DAACs for tech support for 2 persons is show in next column. This cost could be mitigated by having ECS continue to purchase maintenance for Legato.	$16,202
	All servers/PC	Win 32	Starnet	GSFC uses NASA site license	$0
	All servers/PC	F-Secure SS Shell.1 server and 76 clients	Data Fellows		$1,043
	All PCs	Norton Anti Virus (59 Licenses)	Symantec	NASA may have an agency wide agreement for this product.	$1,126
	g0mop65	Superscout Software	Superscout	100 User License	$1,021
	All servers/PC	Cirtix Winframe	Citrix Systems	No technical support purchased for this SW. However a one time subscription was purchased. The cost is shown in the next column.	$2,108
5189	g0mos01	Legato NetWorker 5 Client Connections . 6 licensees	Legato	SW for M&O Backup	$1,581
5189	g0mos01	Legato Networker Edition for Sun Solaris . 1 license	Legato	SW for M&O Backup	$1,269
5189	g0mos01	Legato Autochanger 1-128 Slots. 1 license	Legato	SW for M&O Backup	$1,962
5189	g0mos01	Legato NetWorker Clientpak for PC. 1 license	Legato	SW for M&O Backup	$316
5189	g0mos01	Legato Autochanger 1-16 Slots. 1 license	Legato	SW for M&O Backup	$739
5189	g0mos01	Legato Networker Clientpak for Windows. 1 license	Legato	SW for M&O Backup	$316
5189	g0mos01	Legato Clientpak for Linux. 1 license	Legato	SW for M&O Backup	$316
5189	g0mos01	Legato Networker 25 Connections. 1 license.	Legato	SW for M&O Backup	$4,227
The following list of SUN compilers and Volume Management SW maintenance is purchased by ECS and is loaded on the production string. Current plans are for ECS to continue to purchase maintenance for these products. These products are use for system management.					
	All Sun HW	FFHIS-7999 Sun One Studio Compilers 7.0.	SUN Software bundled with Sun servers and workstations.	Maintenance is required and is sold separately from HW maintenance. ECS will continue to support via ECS SUN maintenance contracts.	$0
	All Sun HW	Media for Sun Studio One Compilers FMKMS-T999-Media	SUN Software bundled with Sun servers and workstations.	Media for SW. ECS will continue to suport via ECS SUN maintenance contracts.	$0
	All Sun HW	Sun Operating System SOL-Media	SUN Software bundled with Sun servers and workstations.	Media for SW. ECS will continue to suport via ECS SUN maintenance contracts.	$0
	All Sun HW	Veritas Volume Manager VVMGS-9999.	SUN Software bundled with Sun servers and workstations.	Maintenance is required and is sold separately from HW maintenance. ECS will continue to support via ECS SUN maintenance contracts.	$0
	All Sun HW	Media for Veritas Volume ManagerVVMGS-9999-Media.	SUN Software bundled with Sun servers and workstations.	Media for SW. ECS will continue to suport via ECS SUN maintenance contracts.	$0
				Total Cost	**$32,224**

5.2 Langley DAAC

Table 5.2-1. LaRC HW Maintenance

EIN	Hostname	Manufacturer	Maint/Vendor	Comments	Fully Burdened HW Maintenance Cost
14775	l0mos01	SUN	SUN		$241
14776	l0mos02	SUN	SUN		$241
14777	l0mos03	SUN	SUN		$241
14778	l0mos04	SUN	SUN		$241
14779	l0mos05	SUN	SUN		$241
14780	l0mos06	SUN	SUN		$241
14782	l0mos08	SUN	SUN		$241
14783	l0mos09	SUN	SUN		$241
10336	l0mos10	SUN	SUN		$241
3697	l0mos12	SUN	SUN		$3,585
14749	l0mos07	SUN	SUN		$241
14750	l0mos14	SUN	SUN		$241
9103	l0mos14	STK	STK		$3,530
14785	l0mos15	SUN	SUN		$241
10339	l0mos16	SUN	SUN		$241
14751	l0mos17	SUN	SUN		$1,263
14784	l0mos18	SUN	SUN		$241
14786	l0mos19	SUN	SUN		$241
10342	l0mos21	SUN	SUN		$241
14781	l0mos22	SUN	SUN		$241
10109	ISSBOCOm04	CISCO	Ingram Micro		$252
14748	l0mos11	SUN	SUN		$252
11078	l0mop06	Micron Net Frame	Micron	Warranty unitl Jun 2003	$0
1611		Cabletron	T&M Daly	Daly time and material maintenance cost is $50.00 to $100.00 per hour depending on HW	$0
6122	LARCCOMM2	Cabletron	Ingram Micro		$252
Multiple	PCs and HP Printers	Multiple	Daly	Daly time and material maintenance cost is $50.00 to $100.00 per hour depending on HW	$0
				Total Cost	**$13,222**

Table 5.2-2. LaRC SW Maintenance

EIN	Hostname	Software	Manufacturer	Comments	Fully Burdened SW Maintenance Cost
4587	l0mos14	Legato NetWorker Technical Support	Legato	Cost for tech support contacts is included in overall cost to ECS for Legato maintenance. Normaly Legato only allows two contacts per contract, but because of the seize of the ECS contract, Legato allows additional contacts. Cost to DAACs for tech support for 2 persons is show in next column. This cost could be mitigated by having ECS continue to purchase maintenance for Legato.	$16,202
		Win 32	Starnet	Using NASA site license	$0
Multiple	Multiple	F-Secure SS Shell. 2 server and 21 clients	Data Fellows	NASA may have a site license for this product	$377
Multiple	Multiple	Norton Anti Virus. 4 Licenses	Symantec	NASA may have a site license for this product	$75
11708	l0mop06	Cirtix Winframe	Citrix Systems	Technical support was never purchased for this product. However a one time upgrade subscription was purchased. The cost is shown in the next column.	$2,003
4587	l0mos14	Legato NetWorker 5 Client Connections 4 licensees	Legato	SW for M&O Backup	$1,001
4587	l0mos14	Legato Network Clientpak for UNIX. 1 license	Legato	SW for M&O Backup	$300
4587	l0mos14	Legato Networker Edition for Sun. 10 clients	Legato	SW for M&O Backup	$1,025
4587	l0mos14	Legato NetWorker Clientpak for PC. 1 license	Legato	SW for M&O Backup	$300
4587	l0mos14	Legato Autochanger 1-16 Slots. 3 license.	Legato	SW for M&O Backup	$2,106
4587	l0mos14	Legato Autochanger 1-32 Slots. 1 license	Legato	SW for M&O Backup	$1,177
4587	l0mos14	Legato Networker Clientpak for Windows. 1 license	Legato	SW for M&O Backup	$300
4587	l0mos14	Legato Clientpak for Linux 1 license	Legato	SW for M&O Backup	$300
The following list of SUN compilers and Volume Management SW maintenance is purchased by ECS and is loaded on the production string. Current plans are for ECS to continue to purchase maintenance for these products. These products are use for system management.					
	All Sun HW	FFHIS-7999 Sun One Studio Compilers 7.0	SUN Software bundled with Sun servers and workstations.	Maintenance is required and is sold separately from HW maintenance. ECS will continue to support via ECS SUN maintenance contracts.	$0
	All Sun HW	Media for Sun Studio One Compilers FMKMS-T999-Media.	SUN Software bundled with Sun servers and workstations.	Media for SW. ECS will continue to suport via ECS SUN maintenance contracts.	$0
	All Sun HW	Sun Operating System SOL-Media	SUN Software bundled with Sun servers and workstations.	Media for SW. ECS will continue to suport via ECS SUN maintenance contracts.	$0
	All Sun HW	Veritas Volume Manager VVMGS-9999.	SUN Software bundled with Sun servers and workstations.	Maintenance is required and is sold separately from HW maintenance. ECS will continue to support via ECS SUN maintenance contracts.	$0
	All Sun HW	Media for Veritas Volume ManagerVVMGS 9999-Media.	SUN Software bundled with Sun servers and workstations.	Media for SW. ECS will continue to suport via ECS SUN maintenance contracts.	$0
				Total Cost	$24,357

5.3 LP DAAC

Table 5.3-1. LP DAAC HW Maintenance

EIN	Host Name	Manufacturer	Maint/Vendor	Comments	Fully Burdened HW Maintenance Cost
3634	e0mos08	Sun	Sun		$1,071
3635	eomos09	Sun	Sun		$1,071
14760	e0mos23	Sun	Sun		$241
14764	e0mos93	Sun	Sun		$241
14763	e0mos92	Sun	Sun		$241
14761	e0mos67	Sun	Sun		$237
14762	e0mos28	Sun	Sun		$241
14702	e0mos03	Sun	Sun		$241
3577	e0mos01	Sun	Sun		$3,585
2144	e0mos01	STK	STK		$7,162
3576	e0mos02	Sun	Sun		$1,585
3581	e0comrack03	Cabletron	T&M Daly	Daly time and material maintenance cost is $50.00 to $100.00 per hour depending on HW	$0
2446	e0comrack03	Cabletron	T&M Daly	Daly time and material maintenance cost is $50.00 to $100.00 per hour depending on HW	$0
3186	M&O hub	Cabletron	T&M Daly	Daly time and material maintenance cost is $50.00 to $100.00 per hour depending on HW	$0
11481	M&O hub	Linksys	Ingram Micro	5 year warranty until 12/31/05	$0
13266	e0comrack03	Cabletron	T&M Daly	Daly time and material maintenance cost is $50.00 to $100.00 per hour depending on HW	$0
Multiple	PCs and HP Printers	Multiple	T&M Daly	Daly time and material maintenance cost is $50.00 to $100.00 per hour depending on HW	$0
				Total Cost	**$15,915**

Table 5.3-2. LP DAAC SW Maintenance

Hostname	Software	Manufacturer	Comments	Full Burdened SW Maintenance Cost
e0mos01	Legato NetWorker Technical Support	Legato	Cost for tech support contacts is included in overall cost to ECS for Legato maintenance. Normaly Legato only allows two contacts per contract, but because of the seize of the ECS contract, Legato allows additional contacts. Cost to DAACs for tech support for 2 persons is show in next column. This cost could be mitigated by having ECS continue to purchase maintenance for Legato.	$16,202
All PCs	Win 32 . 66 licenses	Starnet		$8,072
All PCs/servers	F-Secure SS Shell. 2 servers and 61 client	Data Fellows		$868
All PCs	Norton Anti Virus. 54 licenses	Symantec	USGS may have site license for this product	$979
e0mos01	Legato NetWorker 5 Client Connections. 6 licenses	Legato	SW for M&O Backup	$1,502
e0mos01	Legato Network Clientpak for UNIX. 1 license	Legato	SW for M&O Backup	$300
e0mos01	Legato Autochanger 1-128 Slots. 1 license	Legato	SW for M&O Backup	$1,864
e0mos01	Legato Networker Edition for Sun. 1 incense	Legato	SW for M&O Backup	$1,206
e0mos01	Legato NetWorker Clientpak for PC. 1 license	Legato	SW for M&O Backup	$300
e0mos01	Legato Networker Clientpak for Windows. 1 license	Legato	SW for M&O Backup	$300
e0mos01	Legato Clientpak for Linux. 1 license	Legato	SW for M&O Backup	$300
The following list of SUN compilers and Volume Management SW maintenance is purchased by ECS and is loaded on the production string. Current plans are for ECS to continue to purchase maintenance for these products. These products are used for system management.				
All Sun HW	FFHIS-7999 Sun One Studio Compilers 7.0.	SUN Software bundled with Sun servers and workstations.	Maintenance is required and is sold separately from HW maintenance. ECS will continue to support via ECS SUN maintenance contracts.	$0
All Sun HW	Media for Sun Studio One Compilers FMKMS-T999-Media	SUN Software bundled with Sun servers and workstations.	Media for SW. ECS will continue to suport via ECS SUN maintenance contracts.	$0
All Sun HW	Sun Operating System SOL-Media	SUN Software bundled with Sun servers and workstations.	Media for SW. ECS will continue to suport via ECS SUN maintenance contracts.	$0
All Sun HW	Veritas Volume Manager VVMGS-9999.	SUN Software bundled with Sun servers and workstations.	Maintenance is required and is sold separately from HW maintenance. ECS will continue to support via ECS SUN maintenance contracts.	$0
All Sun HW	Media for Veritas Volume ManagerVVMGS 9999-Media. One copy per site	SUN Software bundled with Sun servers and workstations.	Media for SW. ECS will continue to suport via ECS SUN maintenance contracts.	$0
			Total Cost	$31,892.70

5.4 NSIDC DAAC

Table 5.4-1. NSIDC HW Maintenance

EIN	Hostname	Manufacturer	Maint/Vendor	Comment	Fully Burdened HW Maintenance Cost
3574	n0mos01	SUN	SUN		$1,569
11324	n0mos01	STK	STK		$3,530
3593	n0mos02	SUN	SUN		$3,219
3575	n0mos02	SUN	SUN		$2,818
1839	n0mos20	SUN	SUN		$1,060
3636	n0mos17	SUN	SUN		$1,060
14699	n0mos18	SUN	SUN		$238
11468	m&o comm 3	Cisco	Ingram Micro		$249
11471	catalyst 2924 hub	Cisco	Ingram Micro		$249
Multiple	PCs and HP Printeres	Multiple	Daly	Daly time and material maintenance cost is $50.00 to $100.00 per hour depending on HW	$0
			Total Cost		**$13,993**

Table 5.4-2. NSIDC SW Maintenance

EIN	Hostname	Software	Manufacturer	Comments	Fully Burdened SW Maintenance Cost
Multiple	Multiple	Win 32	Starnet		$1,467
Multiple	Multiple	F-Secure SS Shell 2 server 15 client	Data Fellows	University may have a site license of this product.	$303
Multiple	Multiple	Norton Anti Virus 10 Licenses	Symantec	University may have a site license of this product.	$346
1253	n0mos01	Legato NetWorker Technical Support	Legato	Cost for tech support contacts is included in overall cost to ECS for Legato maintenance. Normaly Legato only allows two contacts per contract, but because of the seize of the ECS contract, Legato allows additional contacts. Cost to DAACs for tech support for 2 persons is show in next column. This cost could be mitigated by having ECS continue to purchase maintenance for Legato.	$16,202
1253	n0mos01	Legato NetWorker 5 Client Connections. 3 licensees	Legato		$751
1253	n0mos01	Legato Network Clientpak for UNIX. 1 license	Legato		$300
1253	n0mos01	Legato NetWorker Clientpak for PC.1 license	Legato		$300
1253	n0mos01	Legato Autochanger 1-32 Slots. 1 license	Legato		$1,004
1253	n0mos01	Legato Networker Clientpak for Windows. 1 license	Legato		$300
1253	n0mos01	Legato Clientpak for Linux. 1 license	Legato		$300
		The following list of SUN compilers and Volume Management SW maintenance is purchased by ECS and is loaded on the production string. Current plans are for ECS to continue to purchase maintenance for these products. These products are use for system management.			n/a
Multiple	All Sun HW	FFHIS-7999 Sun One Studio Compilers 7.0	SUN Software bundled with Sun servers and workstations.	Maintenance is required and is sold separately from HW maintenance. ECS will continue to support via ECS SUN maintenance contracts.	$0
Multiple	All Sun HW	Media for Sun Studio One Compilers FMKMS-T999-Media.	SUN Software bundled with Sun servers and workstations.	Media for SW. ECS will continue to suport via ECS SUN maintenance contracts.	$0
Multiple	All Sun HW	Sun Operating System SOL-Media	SUN Software bundled with Sun servers and workstations.	Media for SW. ECS will continue to suport via ECS SUN maintenance contracts.	$0
Multiple	All Sun HW	Veritas Volume Manager VVMGS-9999.	SUN Software bundled with Sun servers and workstations.	Maintenance is required and is sold separately from HW maintenance. ECS will continue to support via ECS SUN maintenance contracts.	$0
Multiple	All Sun HW	Media for Veritas Volume ManagerVVMGS-9999	SUN Software bundled with Sun servers and workstations.	Media for SW. ECS will continue to suport via ECS SUN maintenance contracts.	$0
				Total Cost	$21,903

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6. DAAC Roles and Responsibilities Following Transition

Table 6-1 provides a listing of recommended tasks that the DAACs will perform following the transition.

Table 6-1. Recommended Task Descriptions (1 of 2)

Services	Recommended DAAC Personnel	Task Description	Remarks/Impacts
Security Management and Systems Engineering	Security System Administrator and SE staff	Management and evaluation of system security and enforcement of established security rules, policies and procedures	Supported by current staffing SE staffing at EDF and DAAC staffing
Network Engineering & Management	System Network Engineer	Management of Domain Names, IP Addresses, etc.	Supported by current SE staffing at EDF and DAAC staffing
System Performance and Status Monitoring, Reporting and Analysis	System Administrator and System Engineering Staff	Monitoring of System Performance and Reporting. Conducting required performance analysis and taking corrective measures to ensure system throughputs before adding any new item to M&O LAN and if system shows performance degradation	Supported by current staffing at DAAC
Baseline Configuration Management	DAAC CM staff	Establishing a HW/SW baseline that includes identifying HW/SW by type and configuration, HW floor plans showing HW location in facility, maintaining a cable management plan for the LAN, and tracking electrical and HVAC use and requirements for LAN HW.	Currently provided by Raytheon DAAC Systems Engineer at EDF. This responsibility will move to the DAAC.

Table 6-1. Recommended Task Descriptions (2 of 2)

Services	Recommended DAAC Personnel	Task Description	Remarks/Impacts
Software License Management	DAAC license management, procurement and logistics staff.	Procuring SW maintenance and tracking license use required supporting the LAN.	Currently provided by ILS staff at EDF. Each DAAC will be responsible for managing, procuring, and maintaining its own SW license needs.
Equipment and COTS Software Configuration Audit	DAAC CM staff	Validating the installed HW/SW configurations against the baseline.	Currently provided for all DAACs by Raytheon DAAC Systems Engineer at the EDF. This responsibility will move to the DAAC.
Maintenance Management (Repair & Replacement)	DAAC logistics coordinator and DAAC procurement staff	Procuring HW maintenance to support the LAN. Making calls to maintenance vendors for support.	Maintenance contracts currently negotiated and purchased for all DAACs by Raytheon team at EDF. DAAC local maintenance coordinator (LMC) currently calls maintenance vendors for support.
Refresh Technology Management	DAAC engineering staff and DAAC system administrators	Determining need for technology refreshment and Selecting, Procuring, and Deploying new HW and SW items.	Currently provided by Raytheon DAAC Systems Engineer and ILS team. This responsibility will move to the DAAC.
Property Management	DAAC property Administration team.	LAN material transferred to the DAACs will have to be incorporated into the DAACs property management system and managed per current DAAC requirements.	Currently provided by LMCs at the DAACs and ILS Property Manager at the EDF. Future property management tasks will be performed solely by the DAACs.

7. Formulation of Required ICD

This section describes the key elements of an ICD between the DAAC M&O systems and ECS, should the M&O environments be decoupled from the ECS/EMD contracts. It also provides a ROM estimate for level of effort required to develop the ICD.

7.1 GSFC DAAC

The ICD for GSFC DAAC will include following items:

- List external interfaces between DAAC M&O LAN system and ECS. Provide brief description of each interface.
- Definition of HW-SW I/Fs and operations utilized between DAAC M&O LAN system and ECS system.
- Identification and description of data flows between DAAC M&O LAN system and ECS. Identify protocols & describe message structure used for these data flows.
- ROM estimate for level of efforts required to develop the ICD for GSFC DAAC is 60-80 hours.
- Address DAAC agreement to provide administrative support including HW and SW to enable ECS/EMD site personnel to perform contractual obligations.

7.2 Langley DAAC

The ICD for Langley DAAC will include following items:

- List external interfaces between DAAC M&O LAN system and ECS. Provide brief description of each interface.
- Definition of HW-SW I/Fs and operations utilized between DAAC M&O LAN system and ECS system.
- Identification and description of data flows between DAAC M&O LAN system and ECS. Identify protocols & describe message structure used for these data flows.
- ROM estimate for level of efforts required to develop the ICD for Langley DAAC is 60-80 hours.
- Address DAAC agreement to provide administrative support including HW and SW to enable ECS/EMD site personnel to perform contractual obligations.

7.3 LP DAAC

The ICD for LP DAAC will include following items:

- List external interfaces between DAAC M&O LAN system and ECS. Provide brief description of each interface.
- Definition of HW-SW I/Fs and operations utilized between DAAC M&O LAN system and ECS system.
- Identification and description of data flows between DAAC M&O LAN system and ECS. Identify protocols & describe message structure used for these data flows.

- ROM estimate for level of efforts required to develop the ICD for LP DAAC is 60-80 hours.
- Address DAAC agreement to provide administrative support including HW and SW to enable ECS/EMD site personnel to perform contractual obligations.

7.4 NSIDC DAAC

The ICD for NSIDC DAAC will include following items:

- List external interfaces between DAAC M&O LAN system and ECS. Provide brief description of each interface.
- Definition of HW-SW I/Fs and operations utilized between DAAC M&O LAN system and ECS system.
- Identification and description of data flows between DAAC M&O LAN system and ECS. Identify protocols & describe message structure used for these data flows.
- ROM estimate for level of efforts required to develop the ICD for NSIDC DAAC is 60-80 hours.
- Address DAAC agreement to provide administrative support including HW and SW to enable ECS/EMD site personnel to perform contractual obligations.

8. M&O LAN Transition Plan and Proposed Schedule

This section defines the proposed tasks and schedule for the M&O LAN Transition.

8.1 List of Transition Tasks:

8.1.1 Conduct Transition Preparations Activities (prior to M&O LAN on-site transition activities)

- Raytheon will work with ESDIS and GSFC property management and the DAACs to affect the quick and efficient transfer of material to the Operations Support Contractors at the DAACs
- Prepare software maintenance licensing documentation and work with COTS software vendors to transfer the license ownership to NASA designated entity for M&O LAN
- Raytheon and DAACs will perform inventory of M&O LAN hardware items. The resulting inventory documentation will be the basis for the property transfer documentation
- Raytheon will prepare CCR and obtain approval for any HW that DAACs want to transfer to the production environment. Raytheon EDF will perform required system and security engineering work before such reconfiguration can occur at the site. This is to ensure that items moving to production system can support 1Gbit LAN interface, and the change in firewall set up, assignment of hostname/IP address, system throughput do not negatively impact the system security and performance. Perform required system integrity and performance testing following the reconfiguration.
- Prepare ICDs for M&O LAN system by DAAC, as required
- Coordinate with the DAAC for the on site transition activities and schedule

8.1.2 Conduct On Site Transition Activities

a. Conduct DAAC site PCA and inventory
   - Conduct a joint site PCA of M&O LAN HW
   - Prepare final inventory of DAAC M&O LAN hardware items for the property transfer documentation

b. Revise and turnover Applicable Documents
   - M&O LAN Site Configuration Document 840-TP-002

c. Provide Training
   - Provide an overview of documentation to DAAC.
   - Provide a brief technical training to maintain ECS Security and Performance, sign off & conclude.
   - Sign off transition document and conclude the M&O LAN turnover to DAAC
   - Incorporate Lessons Learned; i.e. incorporate cumulative lessons learned from the former transition activity to the next

8.1.3 Conduct Post Transition Customer Satisfaction Assessment

- Contact each DAAC and provide required assistance to ensure self sufficiency for efficient and cost effective management of M&O LAN system

8.2 Transition Schedule:

Below is a proposed schedule for M&O LAN transition activities after Raytheon EDF receiving "proceed with transition" (PWT) instructions from ESDIS NASA management.

ID	Task Name	Duration
1	* M&O LAN Transition Schedule *	0 days
2	M&O LAN Pre-Transition Activities	25 days
3	Receive Customer Instruction for M&O LAN Transition	0 days
4	Prepare & Distribute Detailed Task Lists & Schedule	2 days
5	Kickoff Meeiting	1 day
6	Revised Transition Tasks & Schedule	1 day
7	Conduct Transition Preparation Activities	21 days
8	Progress Review	35 days
9	Progress Review 1	0 days
10	Progress Review 2	0 days
11	Progress Review 3	0 days
12	Progress Review 4	0 days
13	Progress Review 5	0 days
14	Progress Review 6	0 days
15	Progress Review 7	0 days
16	Progress Review 8	0 days
17		
18	DAAC On Site M&O LAN Transition Activities	18 days
19	GSFC DAAC	3 days
20	Conduct Site PCA	1 day
21	Revise and Handover Applicable Documents	1 day
22	Provide Training	0 days
23	Sign Off and Conclude	1 day
24	Langley DAAC	3 days
25	Conduct DAAC Site PCA	1 day
26	Revise and Handover Applicable Documents	1 day
27	Provide Training	0 days
28	Sign Off and Conclude	1 day
29	NSIDC DAAC	3 days
30	Conduct DAAC Site PCA	1 day
31	Revise and Handover Applicable Documents	1 day
32	Provide Training	0 days
33	Sign Off and Conclude	1 day
34	LP DAAC	3 days
35	Conduct GSFC DAAC Site PCA	1 day
36	Revise and Handover Applicable Documents	1 day
37	Provide Training	0 days
38	Sign Off and Conclude	1 day
39		
40	Conduct Post Transition Assessment	2 days

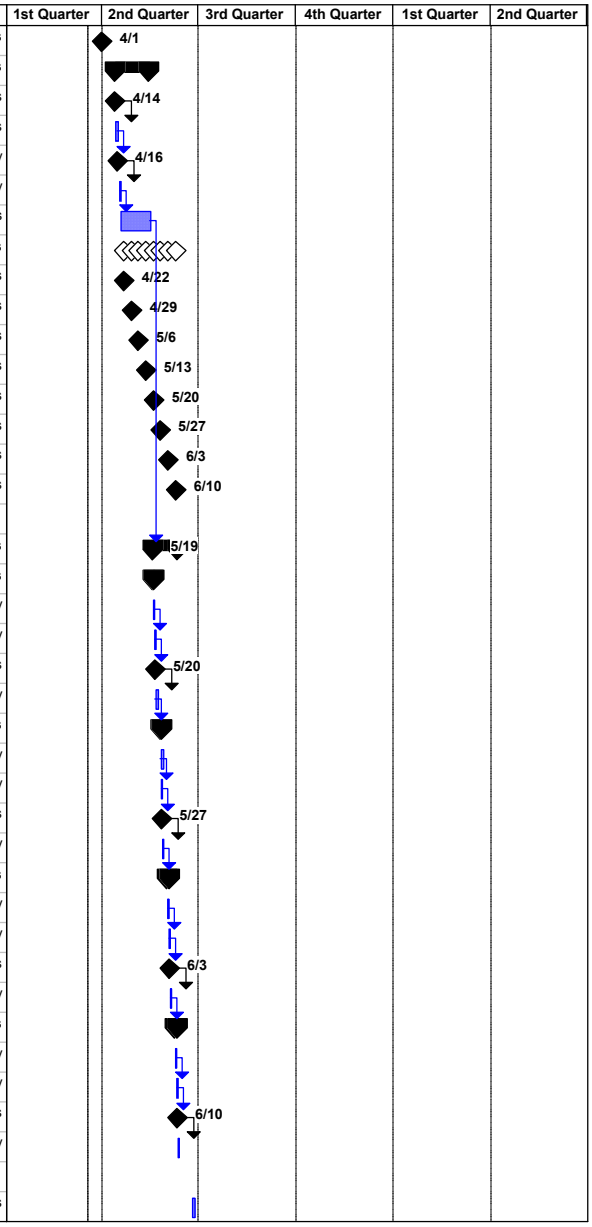

Figure 8-1. M&O LAN Transition Schedule

9. Conclusion

9.1 Summary of Evaluation/Study

The following table provides a summary of costs shown in the tables in section 5.1 through section 5.4. The HW/SW maintenance cost is for the period 01-01-2003 through 12-31-2003. The M&O routine replacement HW and SW and technology refresh tables show costs for the period 01-01-01 through 12-31-02. Each table is broken out by year. Technology refresh for 2001 includes the cost of replacing the older SUN SPARC workstations and servers with SUN Blades to facilitate the transition to Solaris 8. The Solaris 8 OS will not run on the older SUN SPARC HW. The cost of the HW and initial maintenance for the Solaris transition was $104.8K. 2001 technology refresh costs are also higher in 2001 than 2002 because 2001 was the first year any of the original ECS PCs were replaced.

Table 9-1. M&O Cost Summary 2001-2002

M&O LAN HW Maintenance Cost -- 1-1-03 to 12-31-03			
LOCATION	**Hardware**	**Software**	**Total**
GSFC	$24,879	$32,224	$57,103
LP DAAC	$15,915	$31,893	$47,807
LaRC	$13,222	$24,357	$37,580
NSIDC	13,993	$21,903	35,896
DAAC Total	**$68,009**	**$110,377**	**$178,387**
M&O LAN Routine Replacement HW/SW and Initial Maintenance Cost -- 2001-2002			
Note: This includes HW/SW for additional seats for the M&O LAN, replacement of hardware that is not economically repairable, and HW/SW required to support new requirements.			
LOCATION	**2001**	**2002**	**TOTAL**
GSFC and SMC	$29,488	$30,481	$59,969
LP DAAC	$14,531	$236	$14,767
LaRC	$6,487	$5,933	$12,420
NSIDC	$4,530	$3,620	$8,150
DAAC Total	**$55,036**	**$40,270**	**$95,307**
M&O LAN Technology Refreshment HW/SW and Initial Maintenance Cost 2001-2002			
LOCATION	**2001**	**2002**	**TOTAL**
GSFC and SMC	$119,552	$10,628	$130,180
LP DAAC	$60,186	$41,750	$101,936
LaRC	$46,978	$6,046	$53,024
NSIDC	$35,073	$1,466	$36,539
DAAC Total	**$261,789**	**$59,890**	**$321,679**
NOTE: Technology refresh for 2001 includes the cost of replacing upgrading the older SUN SPARC boxes to SUN Blades to facilitate the transition to Solaris 8. The earlier model SUN HW will not run Solaris 8. The cost of the HW and initial maintenance for the Solaris transition was $104.8K. 2001 is also higher than 2002 because this was the first year that the original ECS PCs were replaced.			

9.1.1 Future Technology Refreshment Requirements

Listed below are two known upgrade requirements for the M&O LAN. This list does not purport to be complete, but it shows two examples of upgrades that must be accomplished.

- Upgrade all NT servers to Win 2K. This needs to be completed by 30 June 2003 to meet NASA requirements. This upgrade is required because NT is at end of life and NASA has directed that the OS be replaced because of known security vulnerabilities. Cost will be for Win2K licenses for each M&O PC or server. Some additional COTS products may need to be upgraded because of version incompatibility with Win2K. The Microsoft Office Suite is an example of this type of product.
- Upgrade SUN SPARC Storage Array's, at all DAACs. This upgrade should be completed prior to 31 December 2003 when maintenance coverage is no longer available. This upgrade could be a simple replacement of RAID or it could be more complex involving additional disk in the servers and additional SW licenses to provide the capacity required. This RAID supports UNIX home directory space for the M&O LAN. Storage Array's are at end of service life. ECS has purchased maintenance until 12/31/03.

9.2 Recommendation and Next Step

Recommendations & Rationale

The recommendation of this study is to transition the M&O LAN from the ECS program to the individual DAACs. The rationale for this recommendation is that a large majority of the work associated with the management of the LAN is already being accomplished at the DAACs and transferring the entire responsibility for the M&O LAN to the DAAC simplifies the process by consolidating all the efforts in one organization.

Benefits if Implemented

The benefits of this transition would be greater flexibility in the use, deployment and configuration of the M&O LAN because the efforts are centralized in the single DAAC organization. This would lead to greater efficiencies and possible cost reductions.

Appendix A. Listing of Hardware and Software COTS Products by DAAC

This appendix provides the listing of currently configured hardware and software COTS items by DAAC for M&O LAN system. It is understood that these items will be managed and maintained by each DAAC. It will include identification of parts, quantity, the vendor information and part number of software licenses for each product from the ECS ILM database.

Due to file size and page constraint and, as per customer request, the data in this appendix will be provided separately by electronic means.

A.1 GSFC DAAC

A.2 Langley DAAC

A.3 NSIDC DAAC

A.4 LP DAAC

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Abbreviations and Acronyms

CCR	Configuration Change Request
COTS	Commercial Off the Shelf
CM	Configuration Management
HW	Hardware
SW	Software
EDF	ECS Development Facility
ILS	Integrated Logistic Support
LMC	Local Maintenance Coordinator
LAN	Local Area Network
M&O	Maintenance and Operations
PCA	Physical Configuration Audit
ROM	Rough Order of Magnitude
WAN	Wide Area Network
WS	Work Station

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